Listing of Claims:

What is claimed is:

1   1.   (currently amended) Apparatus for processing an equalizer output signal formed

2   by transmitting an alternate mark inversion input signal over a channel and passing the

3   transmitted signal through an adaptive equalizer, comprising:

4   a correlator circuit block that detects an incorrect convergence of the adaptive

5   equalizer by summing a plurality of consecutive alternate mark inversion symbols and

6   outputs a correlator output signal; and

7   a corrector filter that receives the equalizer output signal and the correlator output

8   signal, and applies a correction to the equalizer output signal based on the correlator

9   output signal, to form a corrected signal that is substantially a time delayed copy of the

10   input signal.

1   2.   (original) The apparatus of claim 1, wherein the correlator circuit block further

2   comprises means for calculating an estimate of an autocorrelation function of the

3   equalizer output signal.

1   3.   (currently amended) ~~The apparatus of Claim 2~~ Apparatus for processing an

2   equalizer output signal formed by transmitting an alternate mark inversion input signal

3   over a channel and passing the transmitted signal through an adaptive equalizer,

4   comprising:

5   a correlator circuit block, with means for calculating an estimate of an

6   autocorrelation function of the equalizer output signal, that detects an incorrect

7   convergence of the adaptive equalizer and outputs a correlator output signal; and

8   a corrector filter that receives the equalizer output signal and the correlator output

9   signal, and applies a correction to the equalizer output signal based on the correlator

10   output signal, to form a corrected signal that is substantially a time delayed copy of the

11   input signal

12   wherein the autocorrelation function calculating means performs the calculation

13   according to the equation:

14
$$R[m] = \sum_{i=0}^{S} y[i]y[i-m]$$

15   where R is the estimate of the autocorrelation function, m is an integer which varies from

16   1 to a maximum expected length for an impulse response function of the channel, y is the

17   equalizer output signal, i is an index, and S is a number of iterations used for the

18   calculation.

1   4.   (original) The apparatus of claim 3, wherein the corrector filter applies a

2   correction based on a maximum value of R calculated by the autocorrelation function

3   calculating means.

1   5.   (original) The apparatus of claim 3, wherein the corrector filter applies a

2   correction based on the equation:

3
$$q[n] = y[n] - y[n-1] + q[n-M]$$

4   where n is an index, $q[n]$ is the corrected signal, $y[n]$ is the equalizer output signal, and M

5   is the value of m for which R has a maximum absolute value when calculated by the

6   autocorrelation function calculating means.

1   6.   (original) The apparatus of claim 2, wherein the autocorrelation function

2   calculating means comprises:

3   a plurality of latches for providing a plurality of delayed equalizer output signals;

4   a plurality of multipliers, each multiplier multiplying the equalizer output signal

5   with a respective one of the delayed equalizer output signals to form a product signal;

6   a plurality of accumulators, each accumulating values of a respective product

7   signal to form a respective sum; and

8   means for identifying which of the accumulators contains a maximum one of the

9   sums.

1   7.   (original) The apparatus of claim 6, wherein the plurality of latches are D-type

2   flip-flops.

1   8.   (original) The apparatus of claim 6, wherein at least one of the accumulators is a
2   register.

1   9.   (original) The apparatus of claim 1, wherein the corrector filter includes an
2   infinite impulse response filter.

1   10.   (original) The apparatus of claim 9, wherein the corrector filter includes:
2   a first latch for delaying the equalizer output signal and outputting a delayed
3   signal;
4   an subtractor for subtracting the delayed signal from the equalizer output signal
5   and providing a difference signal;
6   a plurality of additional latches, each delaying the corrected signal by a
7   respectively different number of clock cycles, each additional latch outputting a
8   respective delayed corrected signal;
9   a multiplexer that selects one of the delayed corrected signals; and
10   an adder that adds the difference signal and the selected delayed corrected signal,
11   to form the corrected signal.

1   11.   (original) The apparatus of claim 10, wherein the first latch or one or more of the
2   additional latches is a D-type flip-flop.

1   12.   (original) The apparatus of claim 10, wherein the correlator output signal is
2   provided to a select input of the multiplexer to select one of the delayed corrected signals.

1   13.   (currently amended) A method for processing an equalizer output signal formed
2   by transmitting an alternate mark inversion (AMI) input signal over a channel and
3   passing the transmitted signal through a blind adaptive equalizer, the method comprising
4   the steps of:
5   detecting an incorrect convergence of the blind adaptive equalizer, based on
6   summing a plurality of consecutive alternate mark inversion symbols at the equalizer
7   output signal; and

8   applying a correction to the equalizer output signal, to form a corrected signal that

9   is substantially a time delayed copy of the AMI input signal.

1   14.   (original) The method of claim 13 further comprising the step of estimating an

2   autocorrelation function of the equalizer output signal; wherein the correction is based on

3   the estimated autocorrelation function of the equalizer output signal.

1   15.   (currently amended) ~~The method of claim 14~~ A method for processing an

2   equalizer output signal formed by transmitting an alternate mark inversion (AMI) input

3   signal over a channel and passing the transmitted signal through a blind adaptive

4   equalizer, the method comprising the steps of:

5   detecting an incorrect convergence of the blind adaptive equalizer, based on the

6   equalizer output signal;

7   applying a correction to the equalizer output signal, to form a corrected signal that

8   is substantially a time delayed copy of the AMI input signal; and

9   estimating an autocorrelation function of the equalizer output signal; wherein the

10   correction is based on the estimated autocorrelation function of the equalizer output

11   signal

12   wherein the step of estimating the autocorrelation function includes performing a

13   calculation according to the equation:

14    $$R[m] = \sum_{i=0}^{S} y[i]y[i-m]$$

15   where R is the estimate of the autocorrelation function, m is an integer which varies from

16   1 to a maximum expected length for an impulse response function of the channel, y is the

17   equalizer output signal, i is an index, and S is a number of iterations used for the

18   calculation.

1   16.   (original) The method of claim 15, wherein the correction is based on the

2   maximum calculated value of R.

1   17.   (original) The method of claim 15, wherein the correction is based on the
2   equation:

$$q[n] = y[n] - y[n-1] + q[n-M]$$

4   where n is an index, $q[n]$ is the corrected signal, $y[n]$ is the equalizer output signal, and M
5   is the value of m for which R has a maximum absolute value when calculated by the
6   autocorrelation function calculating means.

1   18.   (original) The method of claim 14, wherein the autocorrelation function
2   calculating step includes:
3   providing a plurality of delayed equalizer output signals;
4   multiplying the equalizer output signal with respective ones of the delayed
5   equalizer output signals to form respective product signals;
6   accumulating values of each respective product signal to form a respective sum;
7   and
8   identifying a maximum one of the sums.

1   19.   (original) The method of claim 13, wherein the correction applying step includes:
2   delaying the equalizer output signal and outputting a delayed signal;
3   subtracting the delayed signal from the equalizer output signal and providing a
4   difference signal;
5   delaying the corrected signal by a plurality of respectively different numbers of
6   clock cycles, and outputting a respective delayed corrected signals;
7   selecting one of the delayed corrected signals; and
8   adding the difference signal and the selected delayed corrected signal, to form the
9   corrected signal.

1   20.   (original) The method of claim 19, further comprising the step of estimating an
2   autocorrelation function of the equalizer output signal, wherein the step of selecting said
3   one of the delayed corrected signals includes selecting said signal based on the estimate
4   of the autocorrelation function.